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ABSTRACT

Direct observation of a child's motor performance by a parent was hypothesized to exert an effect on motor behavior. The presence of a parent observer during practice was hypothesized to exert a depressing effect on learning and a facilitating effect on performance when parent observer was introduced later in practice. Male and female children age 6 to 10 years were randomly assigned to two groups. In the parent-present-early group, four 25-second trials on a stabilometer were given with a parent present as a passive observer. An additional 4 trials were given after the parent left the testing area. The parent-present-late group was tested in the same way except the parent was absent during the first 4 trials and passively observed during the last 4 trials. Analysis indicated no significant differences between the parent-present-early and the parent-present-late conditions for the learning trials and the performance trials. Analysis of the final two performance trials revealed that children performing without a parent observer were significantly superior to those performing in the presence of a parent. (Author/JD)

Children's Motor Behavior Under Conditions of Parental Observation

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Running head: Parental Observation and Motor Performance

Abstract

Direct observation of a child's motor performance by a parent was hypothesized to exert an effect on motor behavior. The presence of a parent observer during practice was hypothesized to exert a depressing effect on learning and a facilitating effect on performance when parent observer was introduced later in practice. Male and female children (N=24) aged 6 to 10 years were randomly assigned to two groups. In the parent present early group 4 25 second trials on a stabilometer were given with a parent present as a passive observer. An additional 4 trials were given after the parent left the testing area. The parent present late group was tested in the same way except the parent was absent during the first 4 trials and passively observed during the last 4 trials. Separate 3-factor ANOVAs with time off balance as the dependent measure indicated no significant differences between the parent present early and the parent present late conditions and age (6 & 7 vs. 8-10) for the learning trials and the performance trials. Analysis of the final 2 performance trials revealed that children performing without a parent observer were significantly superior to those performing in the presence of a parent, $F(1;20) = 5.0$, $p<.05$.

Children's Motor Behavior Under Conditions of Parental Observation

Landers (1975) has recently outlined the research paradigms associated with motor behavior in the presence of others. Interactive others may compete while working together on the same tasks (competitive coaction paradigm), or interactive others may provide overt social reinforcement. When interaction between the performer and others is eliminated the effects of the mere presence of others may be investigated. Zajonc (1965) has succinctly described the mere presence effects under the heading of social facilitation. In the coaction paradigm two or more persons work at the same tasks. In the audience paradigm one or more persons merely observe(s) another's performance.

Zajonc and others (see Landers, 1975) attach a drive theory interpretation to the effects observed in the social facilitation literature, whereby audience and coaction situations are hypothesized to increase the intensity of a response. Accordingly, the direction of the response, whether predominantly correct or incorrect, determines if the drive from the social situation improves or hinders performance.

A pivotal issue in social facilitation research is the verification of the conditions underwhich an increase in drive due to the

presence of others occurs. Cottrell (1968) under the assumption that drive level can be increased by the presence of others (a fact, biologically, not firmly established in the motor behavior literature, Landers, 1975) reported that mere presence was not a sufficient condition. Drive, he proposed, was a learned response and in social situations dependent upon one's anticipation of positive or negative outcomes as a consequence of behavior. The learned drive interpretation has received considerable support based on evidence that when evaluation apprehension is manipulated, the mere presence of non-evaluative others has little influence on human responding (Cottrell, 1972; Cottrell, et al., 1968; Henchy & Glass, 1968; Lombardo & Catalano, 1975; Paulus & Murdoch, 1971).

The learned drive interpretation is currently widely supported as the mediating process underlying the facilitative, inhibitive, or null performance effects brought about by the presence of others. However, some additional considerations are necessary in the accurate prediction of motor behavioral outcomes under social conditions.

The stage of learning the performer is in is important in the prediction of the effects of social surrounding. Initial practice on a motor task according to a stage theory of motor learning is one of high cognitive involvement. The task demands as perceived by the learner are primarily cognitive. Adams (1971) refers to initial practice in a novel motor situation as the verbal-motor phase; Fitts and Posner (1967) the cognitive stage or the "what to do" stage. In initial prac-

tice, then, the performer may be less able to elicit the proper motor responses because of the high degree of cognitive involvement. In all probability the incorrect motor responses are apt to be dominant. As practice progresses into the motor (Adams) or associative (Fitts & Posner) stage, many of the conflicting and incorrect response patterns are eliminated and the correct responses predominate. Raised drive level as a result of social surroundings increases the intensity of response, and the direction behavior takes is determined by the stage of learning. Initial practice, generally called the learning phase, is inhibited by raised drive while later practice, the performance phase, is enhanced by elevated drive. These contentions are supported in a study by Martens (1969).

The age of the learner would be expected to be a variable in motor skill acquisition in the presence of others. Children may be less able than adults to recognize the potential for evaluation posed by the presence of others. The significance of their performance outcomes in a social situation may not, according to learned drive theory, be sufficient to alter their performance one way or the other. Only in an interactive social situation, e.g., praise or reproof would young children be expected to be aware of others as true evaluators. The bulk of support for the learned drive hypothesis is based on adult subjects. A novel motor task may produce a very exciting situation for a child resulting in his attending more to the task and less to the

presence of others (Thomas & Forston, 1975).

The affective characteristics existing between the performer and the audience must be acknowledged as an important variable in social facilitation research. Neutral audiences and coactors are usually employed, i.e., unknown to the performer. The degree of interpersonal attraction between the performer and the others present would be expected to relate to the drive level induced by the social situation. Landers and Martens (Note 1) found consistency of motor performance to be decreased when liked coactors were used as opposed to disliked or neutral coactors. However, in their study the neutral coactors were not strangers but peers who merely were identified as being neither liked or disliked.

The presence of an experimenter in the testing setting is an audience and cannot be disregarded. Prior experimenter contact and sex can be expected to exert an effect on performance. However, when preschool children were tested on a stabilometer and a perceptual-motor manipulation task neither amount of prior contact with experimenter or sex of the experimenter contributed significantly to performance differences (Thomas & Forston, 1975).

The role of the parent as an audience of one observing a child's motor behavior, as simple as it may seem, is actually quite a perplexing situation to relate to the basic and theoretical body of social facilitation literature. The evaluation potential of a parent in a

non-interactive setting is difficult to predict. The parent must be regarded as being an influential other in the child's social sphere. The parent represents to the child power status, and security. Certainly a strong social bonding exists between parent and child. But, in a novel motor learning situation would the unique relationship between parent and child constitute a greater or lesser potential for evaluation? Would a non-interacting parent be expected to have a response facilitating or debilitating effect on a child's motor behavior?

The purpose of the present study was to examine the role of the mere presence of a parent as a non-interactive audience on children's motor behavior. The unique position a parent has in the child's social sphere was expected to be sufficient to alter drive level when a child performed under conditions of parental observation. Therefore, it was hypothesized that parental observation during the initial stage of skill acquisition would have a more deleterious effect on learning than when learning took place in isolation. And, during later practice a parent observer would enhance performance.

Method

Children (N = 24) and their parents volunteered to participate in response to a letter requesting subjects for a motor learning study.

The five male and 19 female children ranged in age from age six to 10 years ($\bar{X}$ = 7.7, s.d. 1.5) and were randomly assigned to two groups, parent present early and parent present late. Only one of each child's parents served as an observer during the study, four fathers and 20 mothers.

The dependent variable time off balance (.001 sec) was obtained from an electronic timer connected to a stabilometer. The balance platform of the stabilometer measured 60 X 90 cm with the fulcrum located in the middle of the platform and 10 cm above its surface. The platform freely pivoted 12 degrees in each direction before striking metalic contact plates and closing the circuit. Intertrial intervals were automatically controlled on a schedule of 25 seconds work, 25 seconds rest. A warning light visible to the child appeared nine seconds before the end of the rest interval and allowed sufficient time for the child to mount the apparatus and begin balancing. At the conclusion of the work period a tone sounded notifying the child to dismount from the apparatus and sit down.

Parent and child were met and escorted to the laboratory setting by a female experimenter.[1] Both parent and child viewed the apparatus while the child was given standardized directions. Children were specifically instructed to: (a) keep the balance platform steady in the balance position (horizontal) and (b) to try and keep the ends of the platform from hitting bottom. Every child received a few seconds

of physical practice. A total of eight trials were given. In the parent present early group the parent remained in the laboratory as a passive observer during the first four trials and left the laboratory for the final four trials. In the parent present late group the parent was absent for the first four trials but returned to observe the last four trials. Children assigned to the parent present early group were formally told that their parent would remain to watch. Children in the parent present late group were told that their parent would wait in another room behind a closed door. A two minute rest occurred after trial four when parents were formally asked to leave or come into the testing area. During testing the experimenter remained behind a partition hidden from the child's view. Parents, when present, were seated directly in front and two meters away from the stabilometer. At some point prior to testing and not in the presence of the child, each parent was instructed to maintain a passive but interested look and not to speak or gesture to the child. Knowledge of results was withheld, however, following every other trial the experimenter told the child he was "doing fine". The intent was to minimize verbal and non-verbal communication between parent, experimenter, and child.

At the conclusion of the experiment parent and child were debriefed. In particular, the child was told why his parent did not speak during observation.

Results

Using time off balance as the dependent variable separate 3 factor analyses of variance, Parental Presence X Age X Trials (2 X 2 X 4), were computed for trials 1-4, the learning phase, and trials 5-8, the performance phase of the experiment. Children in each parental condition were grouped according to age, 6 and 7 years old and 8-10 years old. In the learning phase the main effects for parental presence, $F(1,20) = 1.35$, $p>.05$, age, $F(1,20) = 1.31$, $p>.05$, and the interaction failed to reach significance. The trials effect was significant as expected, $F(3,60) = 15.0$, $p<.001$, and follow-up indicated that each trial was significantly different from the other. None of the trials interactions were significant. Neither the parental presence, $F(1,20) = 2.51$, $p>.05$, age, $F(1,20)<1$, or the interaction reached significance in the performance phase. The trials effect was significant, $F(3,60) = 4.50$, $p<.01$, but none of the trials interactions were.

The main effect of parental presence plotted over trials is illustrated in Figure 1.

Insert Figure 1 about here

Although statistical analyses verified that no real differences existed between the groups for the two 4 trial phases of practice, in the performance phase the parent present late group appeared to reach asymptote.

However, the parent present early group made large gains in trials 6-8. A 3-factor analysis of variance using only trials 7 and 8 indicated that the parent present early group was performing significantly better than the parent present late group, $F(1,20) = 5.00$, $p<.05$.

The fact that a range in age was present in the children used as subjects and under the supposition that parental presence may differentially affect the consistency of motor performance in different aged children, a second dependent variable was used. The standard deviation of a child's performance about his or her mean score for each 4 trial phase of the experiment was calculated. Although the homogeneity of variance assumption for parametric statistical techniques may be violated in the case of intrasubject standard deviation scores, such procedures have been reported (Carron & Bennett, 1976; Landers & Martens, Note 1). Multiple t tests between mean intravariance scores for the comparisons of interest indicated that the 6 and 7 year olds were significantly more inconsistent in their performance than the 8-10 year olds in the learning phase with the parent present, t (10) = 3.22, $p<.01$. Their mean time off balance scores, though, were quite similar, 5.650 and 5.960 seconds, respectively.

Discussion

The hypothesis that parental presence during initial acquisition of motor skill would have an adverse effect on motor learning as compared to learning alone was not supported. Children learning a balance skill

in the presence of their parents actually did somewhat better than children performing alone. If the learned drive hypothesis is correct it may be assumed that the presence of a parent audience resulted in insufficient changes in drive state to bring about motor learning changes. Under the conditions of this study the effects of a passive parent observer were not unlike the reported effects of a passive audience in the null changes produced (Bird, 1973; Singer, 1970). The non-significant initial practice differences may be assumed to be the result of the lack of evaluation potential. When knowledge of results (KR) was withheld from a blindfolded audience in a study by Landers and Goodstadt (1972), as KR was withheld from the parent in the present study, performance was depressed. A blindfolded audience which received KR was sufficient to bring about performance gains in female subjects. When KR was made available to a blindfolded audience, performing subjects' heart rates increased significantly over basal levels. Without KR subjects' heart rates were not increased. KR may be a necessary condition for evaluation potential and the resulting predicted effects of the learned drive hypothesis. So, in spite of the fact that a parent is a somewhat special audience to a child, objective performance information appears necessary if parental observation is to significantly alter the initial learning of a gross balance task.

There were no significant differences found between the time off balance scores of the 6 and 7 and 8-10 year old children in either

audience condition. Both age groups learned the task at similar rates and to similar levels of proficiency. In the presence of a parent observer, though, younger children were found to be less consistent in their performance. The mere presence of the parent, although not affecting performance quality, appeared to have produced some other undefined influence. Such an effect may be associated with the idea that mere presence may occasionally produce shifts of attention between task and observer, a situation that young children would be particularly susceptible to.

During the performance phase of practice the parent present late group was hypothesized to show larger gains in performance than the parent present early group. The dominant responses were predicted to be the correct ones and parental presence would tend to enhance their emission because of heightened drive. What in fact occurred was a somewhat depressed rate of gain evidenced by an asymptotic performance curve. On the other hand the parent present early group displayed sharp gains in performance which resulted in a significant difference between the groups for the last two trials of practice. It would appear from inspection of Figure 1 that the parent leaving enhanced performance and the introduction of the parent retarded performance. Children in the parent present late group were unaware they were to be observed, and the element of surprise may have interfered with task concentration.

With only four trials of previous practice on the stabilometer, children's performance may not have been characterized by predominantly

correct responses as assumed. Thus, with the sudden appearance of a parent audience, drive level may have increased sufficiently to prompt the emission of still incorrect responses. Since there is evidence in the present study that the presence of a parent observer hindered motor skill performance in children, in opposition to the predictions of social facilitation theory, a closer look into the methodology of such experimentation must be taken.

Reference Note

1. Landers, D. M. & Martens, R. Interpersonal attraction and task difficulty effects on the motor performance of coacting groups. Unpublished manuscript, 1973. (Available from [D. M. Landers, Physical Education, Pennsylvania State University]).

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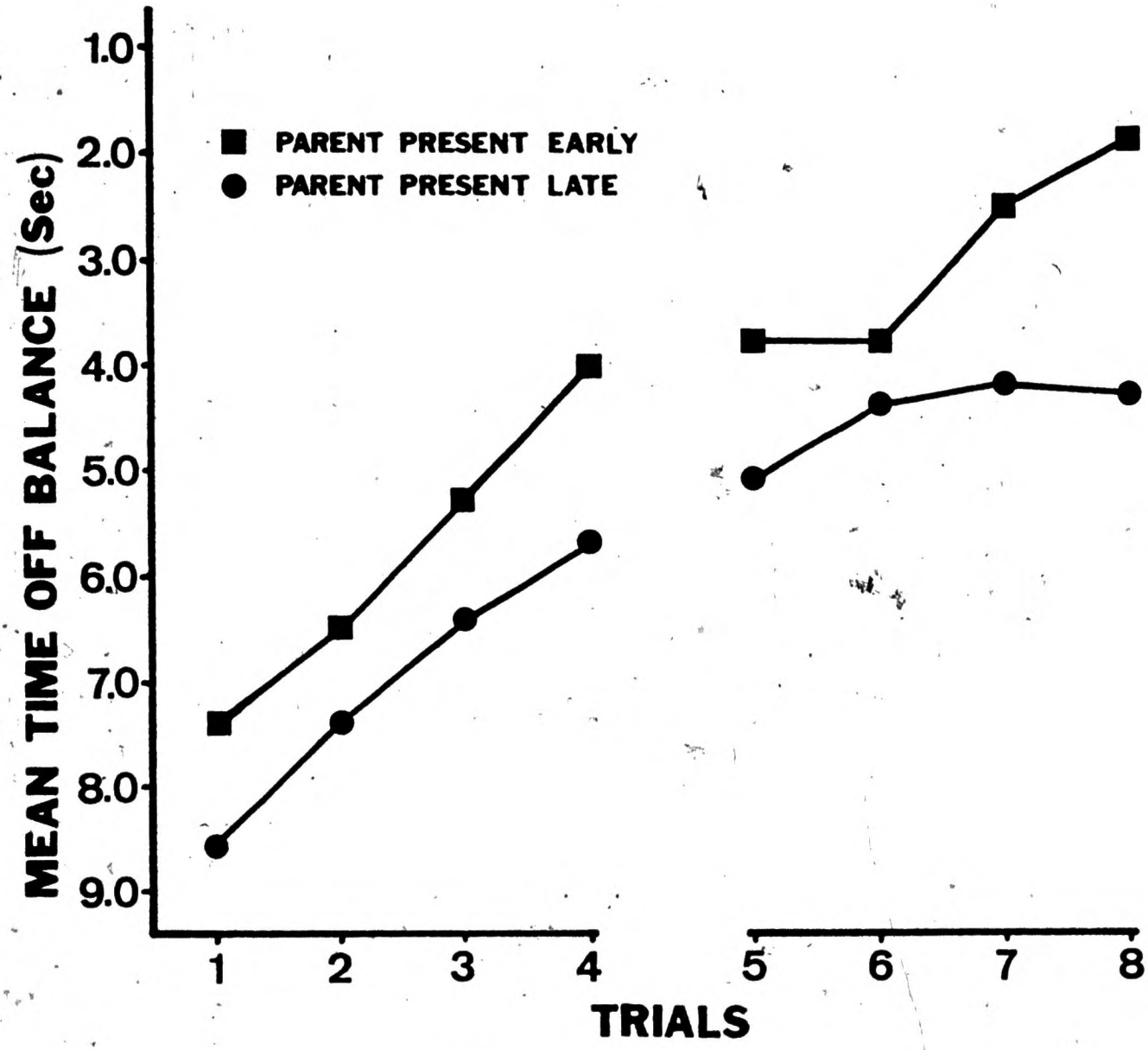
Footnote

[1]Appreciation is extended to Ms. Sally Hager for her assistance in the collection of data.

Figure Caption

Figure 1. Mean stabilometer time off balance scores of children practicing under parental observation initially or later in practice.


PARENT PRESENT EARLY
PARENT PRESENT LATE
MEAN TIME OFF BALANCE (Sec)
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
1
2
3
4
5
6
7
8
TRIALS